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Hummbrella, a New Red Alga of Uncertain Taxonomic Position from the Juan Fernandez Islands

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HUMMBRELLA
A NEW RED ALGA OF UNCERTAIN TAXONOMIC POSITION FROM THE JUAN FERNANDEZ ISLANDS

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Summary

A new genus and species, *Hummbrella hydra,* of uncertain taxonomic position among the Rhodophyta, collected at several locations in the Juan Fernandez Islands, is described and illustrated.

Introduction

Collections of a strikingly new red alga were made at several locations at Mas a Tierra, Juan Fernandez Islands, Chile, 33°38′S, 78°48′W, during Cruise 12 of the R/V *Anton Bruun* in December, 1965. I obtained the first plants by diving with scuba in 12 meters depth at Cumberland Bay and later observed and collected it at several locations in 10 to 32 meters depth. Additional material was obtained from 80 to 150 meters depth using a beam trawl and otter trawl. Several hundred plants were preserved intact in 5% sea water formalin, including numerous small individuals attached to rocks, and 68 herbarium specimens were pressed and dried immediately.

The species is apparently unique among the Rhodophyta, distinct from any known family, and of uncertain ordinal relationship. This paper presents the type description and ecological observations; a detailed study of morphology and taxonomic relationships of this very unusual plant will be reported later in collaboration with Dr. Max A. Hommersand.

Hummbrella gen. nov.

Planta erecta, substratis solidis disco basali arcte affixa, stipitata, stipite cartilagineo, apice ramis vulgo numerosis coronato mollibus, lubricis, radiantibus.

Stipes e filamento unico centrali cellularum oriens, ramos verticillatos efferens et tandem quoque filamentia corticantia quae, ut videtur, stipitem confirmant. Rami seriebus ex apice stipitis oriuntur, in centro juni-

ores, adultioribus circumcincti. Structura ramorum ut in stipite (filamento centrali ramulos verticillatos in matrice gelatinosa inclusos efferenti, tandem filamentis corticantibus munito). Stipes et rami cortice monostromatico vestiti sunt.

Planta monoica. Spermatangia superficialia. Ramuli carpogoniferi 3-cellulares.

Ramuli carpogoniferi 3-cellulares, dein post fecundationem 4-cellulares. Fecundatione effecta, carpogonium cellulam connectentem abscindit et haec cum cellula fulcranti sese conjungit. Cellula fulcrans velut cellula auxiliaris fungitur et superficiem plantae versus initium unicum gonimoblastematicum abscindit. Gonimolobi aliquot tum formantur, cellulis plurimis sese in carposporangia transmutantibus. Filamenta vegetativa circumcingentia longitudine crescunt, involucrum calathiforme formantia. Cystocarpia matura conspicua evadunt.

H. hydra sp. nov.

Planta erecta, usque ad 115 mm alta, rosea, translucens, substratis solidis disco basali arcte affixa, stipitata, stipite cartilagineo, usque ad 33 mm alto, apice ramis vulgo numerosis (1-plus quam 100) coronato mollibus, lubricis, radiantibus, usque ad 91 mm longis, plene evolutis 1-2 mm crassis, attenuato-acuminatis.

Rami seriebus ex apice stipitis oriuntur. Plantae 2-3 mm altae jam ramis praeditae sunt.

Hummbrella gen. nov.

Plant upright, firmly attached by a disk at the base of a cartilaginous stalk; stalk crowned with soft, lubricous, radiating branches.

Stalk originally composed of single central filament of cells which gives rise to whorls of branchlets and, later, corticating filaments that apparently reinforce and strengthen the stalk. Branches arise in series from the apex of the stalk, the youngest branches in the center, surrounded by older members. Branch structure similar to stalk, with central filament bearing whorls of branchlets embedded in a gelatinous matrix, later reinforced with corticating filaments. Stalk and branches covered by a monostromatic cortex.

Plant monoecious. Spermatangia superficial. Carpogonial branch of 3 cells, becoming 4-celled at fertilization. After fertilization, the carpogonium cuts off a connecting cell that fuses with the supporting cell. The supporting cell functions as an auxiliary cell and cuts off a single gonimoblast initial toward the surface of the plant. Several gonimolobes are formed and most cells mature into carposporangia. Surrounding vegetative filaments elongate forming a basket-like involucre. Mature cystocarps are conspicuous.

H. hydra sp. nov.

Plant upright, to 115 mm tall, translucent pink, firmly attached to hard substratum by a disk at the base of a cartilaginous stalk; stalk up to 33 mm tall, crowned with one to more than one hundred soft, lubricous, radiating branches up to 91 mm long, tapering to a point, 1-2 mm diam. when mature (Figs. 1, 2).

One to more than 100 branches arise in series from the apex of the stalk (Figs. 3, 4), first developing when the plant is 2-3 mm high. Basic structure of stalk and branches is similar, both originally consisting of a central filament of cells which gives rise to whorls of branches (Figs. 5-7), later reinforced with corticating filaments (Fig. 8).

Type: Plant collected by Sylvia A. Earle and Alan Chapman, 13 December, 1965, on rock in 20 meters depth, N.W. side of Punta Suroeste, Mas a Tierra, Juan Fernandez Islands, Chile, station SE65247. Holotype: Farlow Herbarium; isotypes: U.S. National Herbarium, Washington, D.C.; Herbarium, University of California, Berkeley.

Skottsberg (1941) reported on algal communities of the Juan Fernandez Islands and described the precipitous rocky shoreline, strong surf, and inaccessibility that characterizes the islands, emphasizing the difficulties of shore collecting. For my work, effective use was made of scuba apparatus for exploration in depths up to 35 meters.

In all situations where *Hummbrella hydra* was observed, the plants were growing firmly attached to rocks in areas of moderate to heavy surge. The flexible, cartilaginous stalk bent with the surge, and the soft branches flowed with the current giving the impression of wave-washed *Postelsia palmaeformis,* or of palm trees in a violent storm.

Wherever *Hummbrella* was found, it occurred in abundance, covering most horizontally oriented rock surfaces, but it was conspicuously absent from vertical faces of large rocks and cliffs. Small pebbles often supported only one or two plants, but many rocks were entirely covered by a dense stand of *Hummbrella* of various sizes. At stations SE65240 and SE65247, from my vantage at 20 to 30 meters depth I could see *Hummbrella* attached to cobble covering the downward slope as a miniature pink forest extending seaward beyond my range of vision. Several locations in 1 to 30 meters depth were explored that appeared to have no *Hummbrella* present, although I looked for it with particular care at all stations after the first discovery. It apparently is best suited to depths of more than 10 meters, possibly a response to favorable low light intensity.

Water temperature at the collection sites ranged from 13.3 to 17.3°C.

The abundance of *Hummbrella* and the apparent absence of tetrasporic plants suggests that I may have encountered a seasonal "bloom." This possibility, plus the deep water habit of the plant, may account for the absence of *Hummbrella* in the very careful and extensive collections

by Skottsberg, reported by Levring (1941) and Skottsberg (1941), and the later work by Etcheverry (1960).

I take pleasure in naming this plant with a descriptive epithet that honors Dr. Harold J. Humm, phycologist and Director, Marine Science Institute, University of South Florida.

Acknowledgements

I am indebted to Robert Wisner, chief scientist during Cruise 12 of the R/V *Anton Bruun,* for his help and cooperation during the cruise; to the National Science Foundation for the opportunity to participate in the expedition; to Alan Chapman, John Hall, and Loren Woods for their collaboration while diving; and to I. Mackenzie Lamb for the Latin diagnoses.

References

ETCHEVERRY, H. D. 1960. Algas marinas de las islas oceanicas Chilenas (Juan Fernandez, San Felix, San Ambrosio y Pascua). Revista de Biologia Marina 10: 83-132, pls. 1-6.

LEVRING, T. 1941. Die Meeresalgen der Juan Fernandez Inseln. *In*: Skottsberg, C. The natural history of Juan Fernandez and Easter Island. 2: 601-670, pls. 49-53. Uppsala.

SKOTTSBERG, C. 1941 Marine algal communities of the Juan Fernandez Islands, with remarks on the composition of the flora. *Ibid*. Pp. 671-696.

Station Data for Collection Sites of *Hummbrella hydra*

Station SE65235 11 December, 1965 33°38′20″S, 78°48′50″W
Cumberland Bay, Mas a Tierra. Depth: 12 meters.
Method: scuba.
Bottom: boulders grading to cobble.

Station SE65240 12 December, 1965 33°37′18″S, 78°50′20″W
0.5 mi N.W. of San Carlos Point, Mas a Tierra. Depth: 29-32 meters.
Method: scuba.
Bottom: large rocks; sand with cobble starting at 30 meters.

Station SE65243 12 December, 1965 33°37′00″S, 78°50′50″W
S.W. of West Bay, N. side of Mas a Tierra: Depth: 10 meters.
Method: scuba.
Bottom: sheer rock faces grading to cobble.

Station SE65245 12 December, 1965 33°37′30″S, 78°49′50″W
N. side of Mas a Tierra. Depth: 150 meters.
Method: beam trawl.

Station SE65247 13 December, 1965 33°37′30″S, 78°55′00″W
N.W. side of Mas a Tierra S. of Punta Suroeste. Depth: 20 meters.
Method: scuba.
Bottom: sheer rock faces grading to cobble.

Station SE65253 14 December, 1965 33°38′10″S, 78°56′35″W
W. end of Mas a Tierra. Depth: 80-125 meters.
Method: 40 ft otter trawl.

Station SE65257 15 December, 1965 33°40′S, 78°55′W
W. end of Villagra Bay, Mas a Tierra. Depth: 12 meters.
Method: scuba.
Bottom: large rocks grading to fine pebbles.

Station SE65260 16 December, 1965 33°38′00″S, 78°48′00″W
S.E. of Bacalao Point, Mas a Tierra. Depth: 27-30 meters.
Method: scuba.
Bottom: submerged castle-like formation of rock 200 meters offshore bordered by sand with numerous black pebbles and shells.

FIG. 1. *Hummbrella hydra,* holotype. Habit. Obtained from Sta. SE65247.

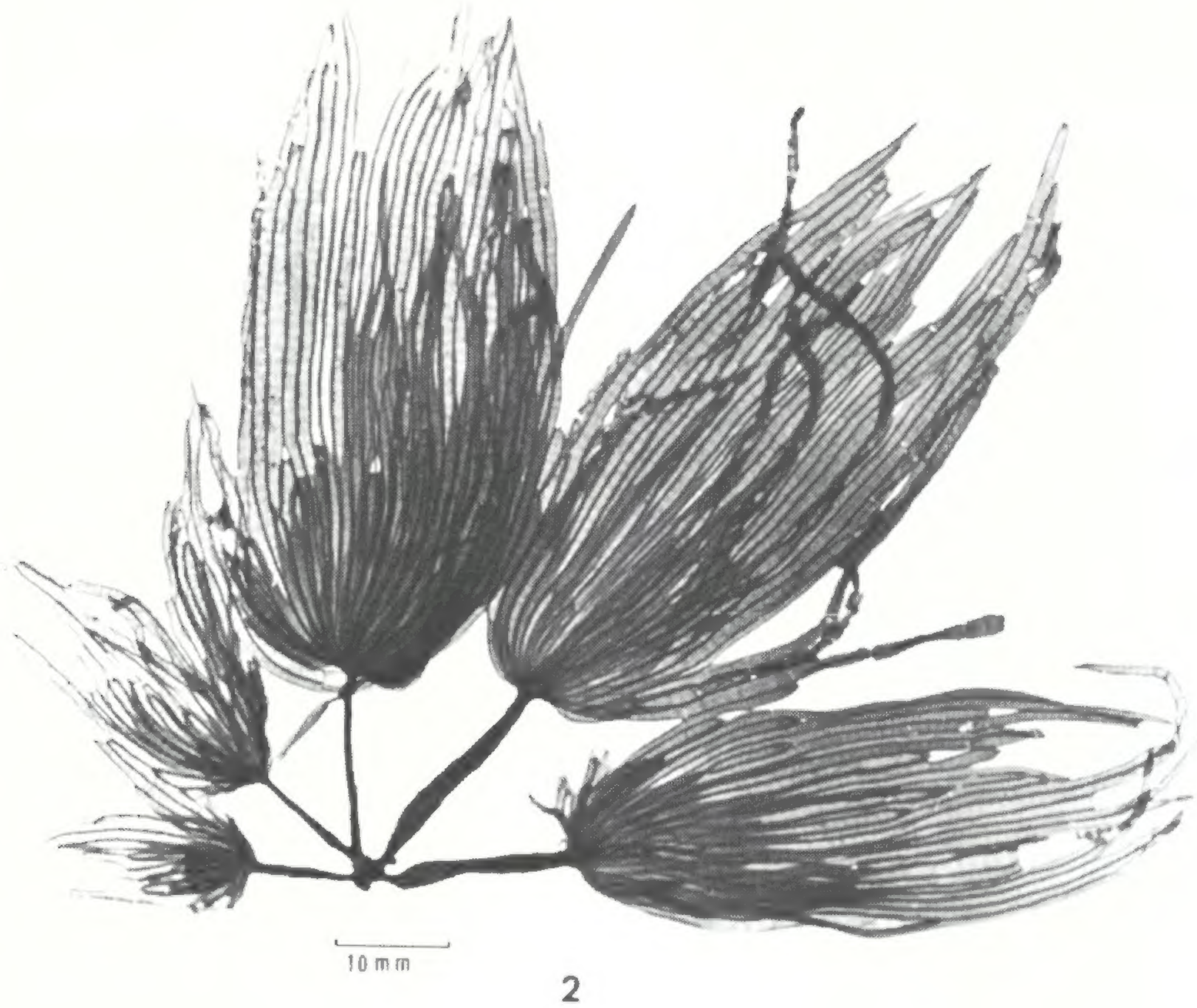


FIG. 2. *Hummbrella hydra*. Habit of cluster of plants taken from a single small rock obtained from Sta. SE65243.

FIG. 3. *Hummbrella hydra*. Central part of crown of branches at apex of the stalk. Photomicrograph by Max A. Hommersand.

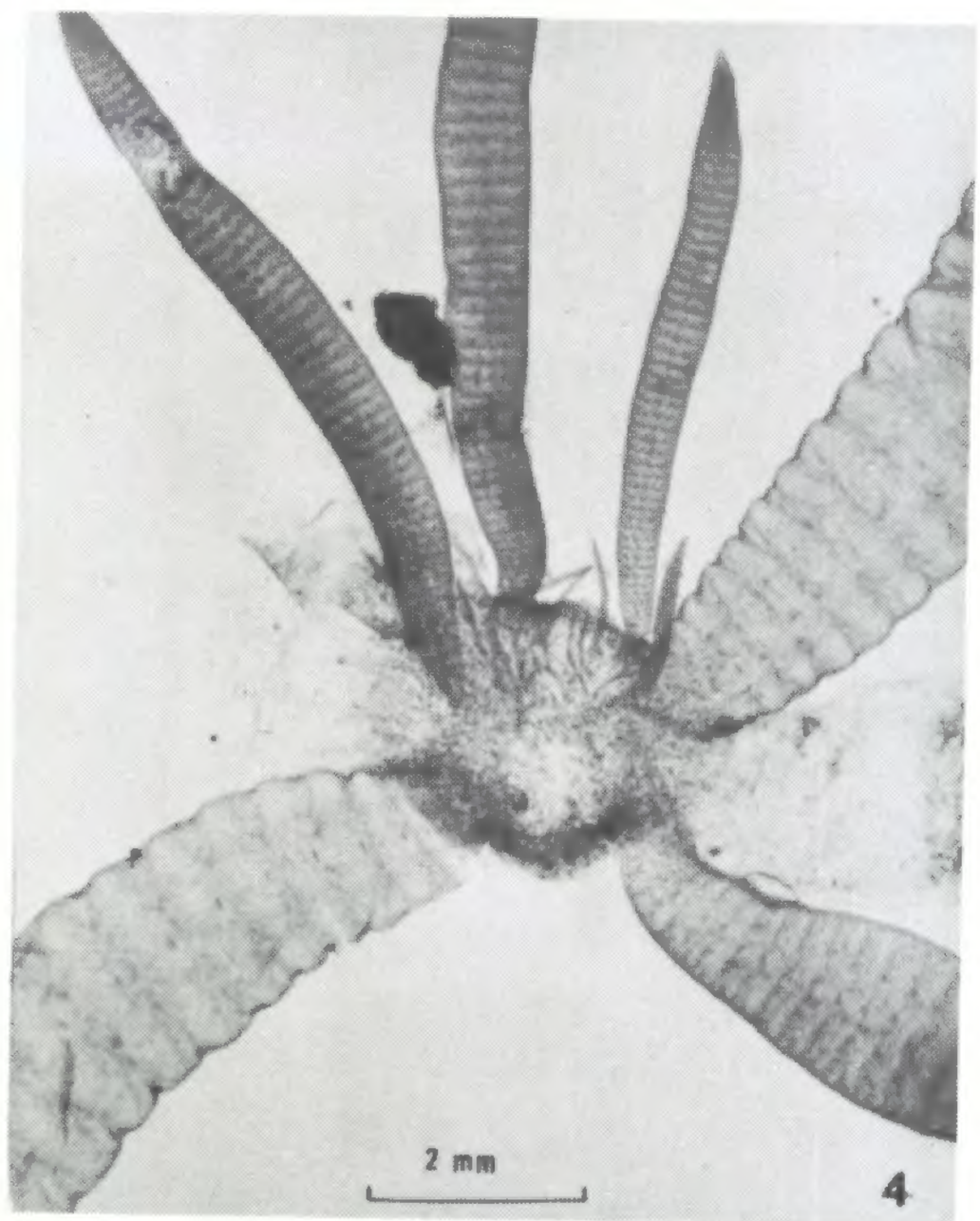
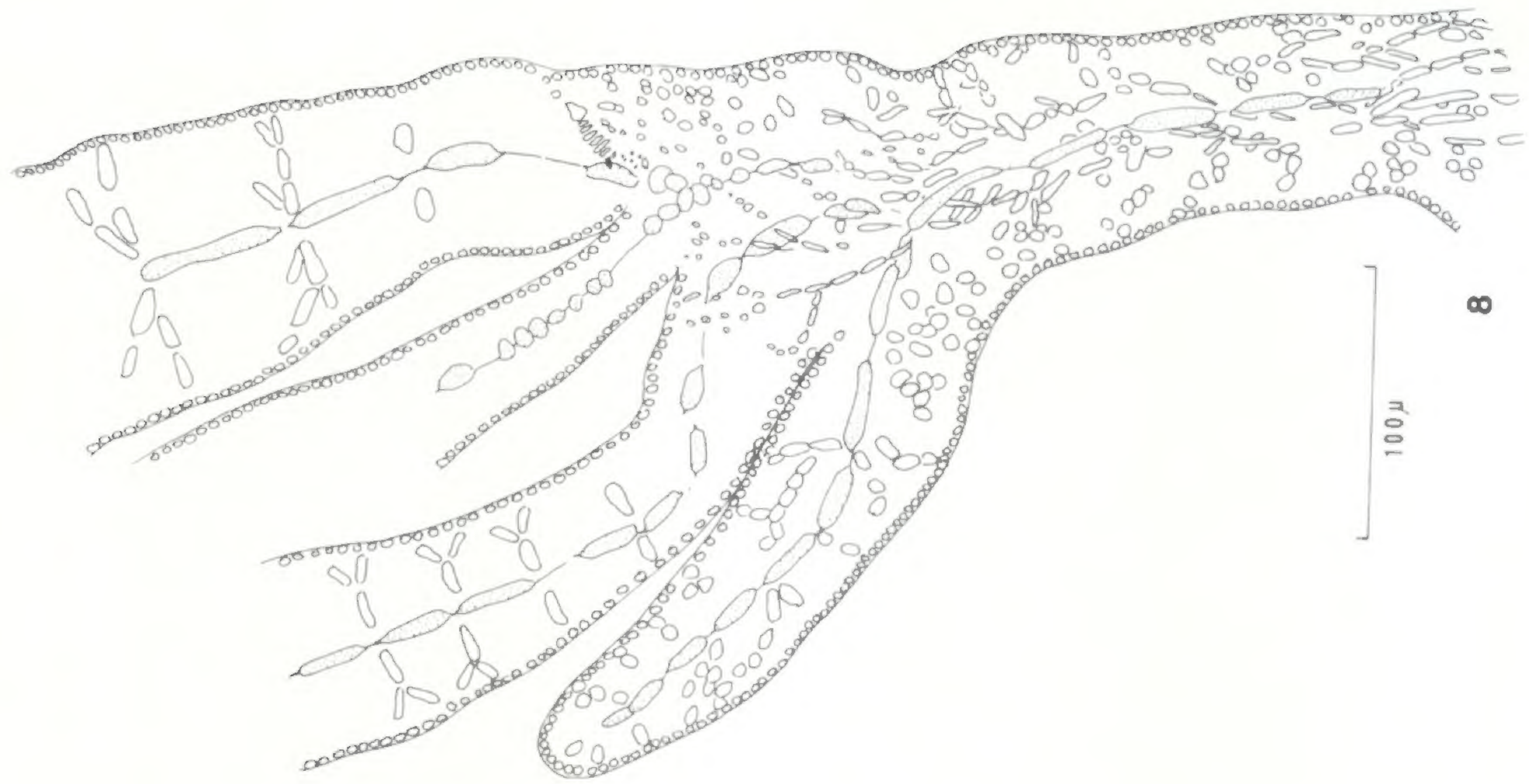
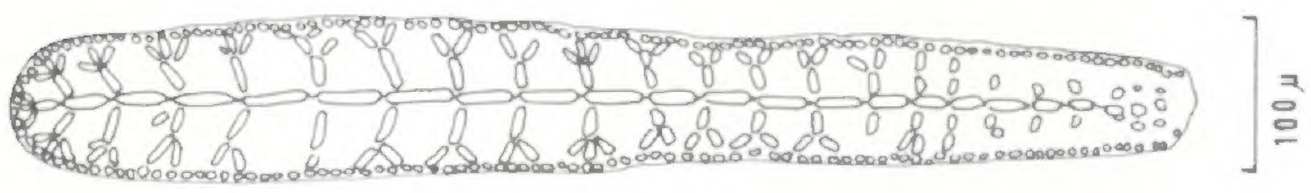
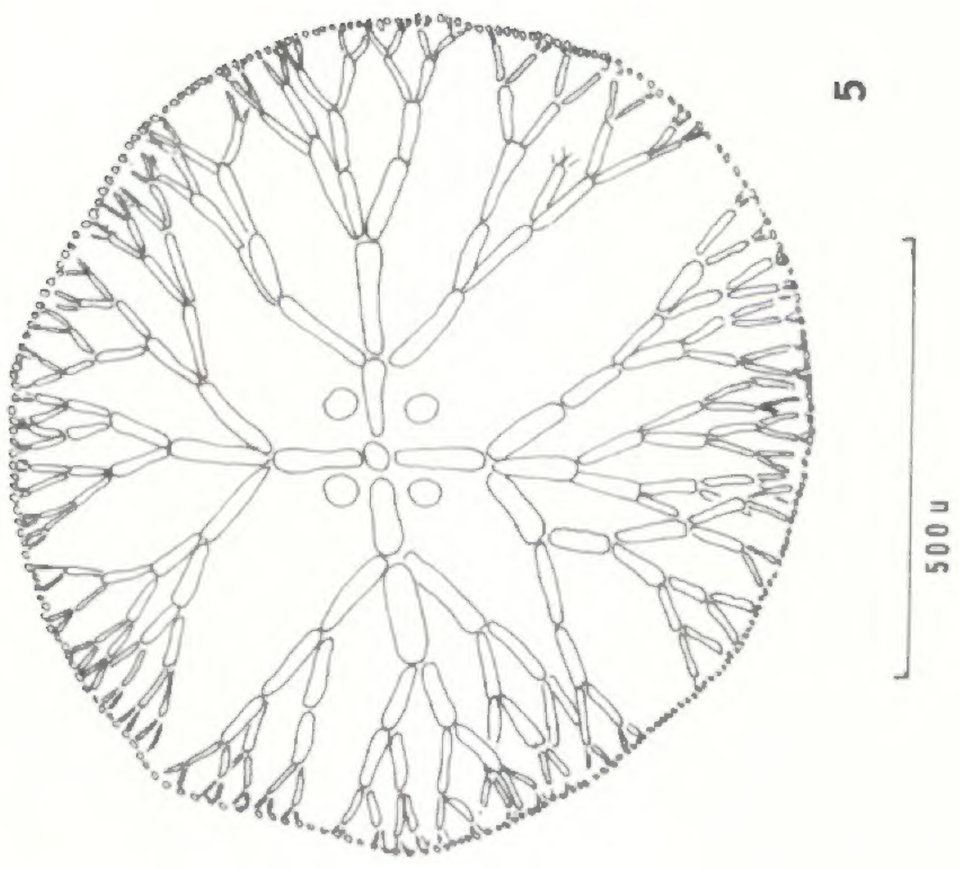


FIG. 4 *Hummbrella hydra*. Crown of branches viewed from above showing arrangement of young branches in the center surrounded by older branches. Photomicrograph by Dr. Max A. Hommersand.







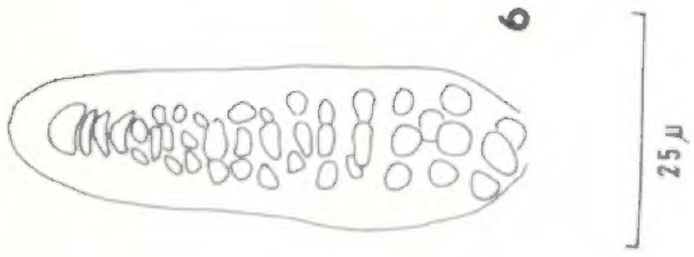


FIG. 5. Transverse section of young branch showing central filament and associated branchlets.

FIG. 6. Longitudinal view of young plant, prior to formation of crown of branches.

FIG. 7. Longitudinal view of young plant showing central filament, whorls of branchlets, and monostromatic cortex, prior to formation of crown of branches.

FIG. 8. Longitudinal view of young plant with crown of four branches, showing corticating filaments.